

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:

June ...	Imperial Air Conference
June 10 ...	Race, Lugo-Trieste-Triente-Lugo
July 2 ...	Aerial Pageant (Hendon) for R.A.F. Memorial
July 6 ...	Entries close for Aerial Derby
July 16 ...	Aerial Derby
July 29-31	Jacques Schneider Cup, Venice
Aug. 27 ...	Entries Close for Coupe Deutsch
Sept. 4-11	Brescia Races
Sept. 5 ...	Pulitzer Trophy, Detroit, U.S.A.
Sept. 18 ...	Gordon Bennett Balloon Race
Sept. 25-	
Oct. 2	Aero Exhibition, Prague
Oct. 1 ...	Coupe Deutsch de la Meurthe
Nov. 12-27	Paris Aero Salon

EDITORIAL COMMENT



As will be gathered from the terms of an Air Ministry *communiqué* which we print in another part of this issue of FLIGHT, the future of British airships is very much on the knees of the gods. Unless the ships are taken over by a commercial firm, willing to operate them, by August 1, all airship activities under the Air Ministry will be discontinued, and airships, stations and material will be handed over to the Disposals Board, "as the Air Ministry does not feel justified in continuing expenditure on this service."

Surely before the expiration of the term set by the Ministry some syndicate will be got together to take advantage of the offer of the Government, which is a most generous one—probably the most generous of its kind that has ever been made. Briefly, it means that six great rigid airships, including the two surrendered Zeppelins L. 64 and L. 71, can be acquired free, gratis, and for nothing. Not only this, but in addition the Government offers, free of cost, all other airship material, such as equipment, stores, plant and spares appertaining to airships and airship stations, including any German airship material received under the terms of the Peace Treaty, and the shed and equipment for an overseas base. It will place at the disposal of such a company all available airship information and data, with all pertinent information in the possession of the Air Ministry in wireless telegraphy, meteorology, etc., and all the results of airship experimental work. It will further lend to the company for a limited period such specialist airship *personnel*, to be paid by the company, as the latter may require to operate and maintain the material taken over. Finally, it will sell or lease to the company, on terms to be agreed, the Cardington and Pulham airship bases, complete with all equipment, stores and plant as they now stand.

In return for all this the Government simply stipulates that the capital of the company shall be controlled by British shareholders; that the Air Ministry shall be represented on the board of directors; that all material will be utilised for the development of airship transport; and that none of the material handed over, without consideration, by the Government

will be disposed of by sale or free gift except by permission of the Government. A very reasonable set of conditions, as most people will agree.

Not a White Elephant

At first sight, the anxiety of the Government to get rid of the airships on such terms might lead people to think that a syndicate or company formed for the purpose of taking them over would find itself possessed of a white elephant. It is but fair to say that such a company would have to spend a great deal of money in making any contemplated services effective, but then no commercial enterprise can be started without a certain amount of capital being sunk. Nor do we imagine that the people who have been nibbling at the Government offer are under the delusion that all they have to do is to get possession of the ships and equipment in order to get services going—and paying their way—forthwith. Nobody would expect to do that in the case of a steamship line, even though it acquired its vessels, stores and equipment for nothing at the outset.

The main question that has to be decided in the beginning is: Can airships be operated commercially in such a way as to prove a remunerative investment? We have called that the main question because there is not a doubt about the saving of time which such craft can effect in comparison with other methods of transport. At present, for example, it takes six days to reach Egypt by steamer. An airship travelling at 45 knots, which is quite a moderate speed, will do the journey in a little over two days. Similarly the passage to Bombay now takes sixteen days, while the airship would do it in six. Australia is now 32 days from the Mother Country, which could be shortened to 11 days by airship. We could go on multiplying these examples *ad infinitum*, but these are quite enough to show the enormous possibilities that lie before airship transport, if it is given its chance, and assuming that our main question can be answered affirmatively.

As to that, we believe that all the ascertained facts and data go to show that it is possible to operate these craft commercially. Let us quote one example. The present first-class fare to Bombay is £120. In the course of a recent lecture before the members of the House of Commons, Air-Commodore Maitland stated it was possible, with the present types of airship, to carry passengers to India at a fare of £100, and to show a profit on the passenger service alone of 15 per cent. If we assume that the Post Office would give at least a part of the mail contracts to an airship line—and there is no doubt it would as soon as the necessary regularity of service had been proved—then the figure of profit stated must obviously be increased substantially. The figure, too, must obviously improve as improved airships come into use. Not only the data and information obtained in this country go to prove the commercial possibilities of the big airship. We publish, in addition to the *communiqué* already referred to, some interesting notes relating to what has been happening in other countries in connection with airship services. In Germany, particularly, it seems to have been proved to reasonable satisfaction that these ships can be operated profitably. In fact, wherever we look we seem to see practical proof of the great possibilities that lie before airship transport.

Must They Be Scrapped?

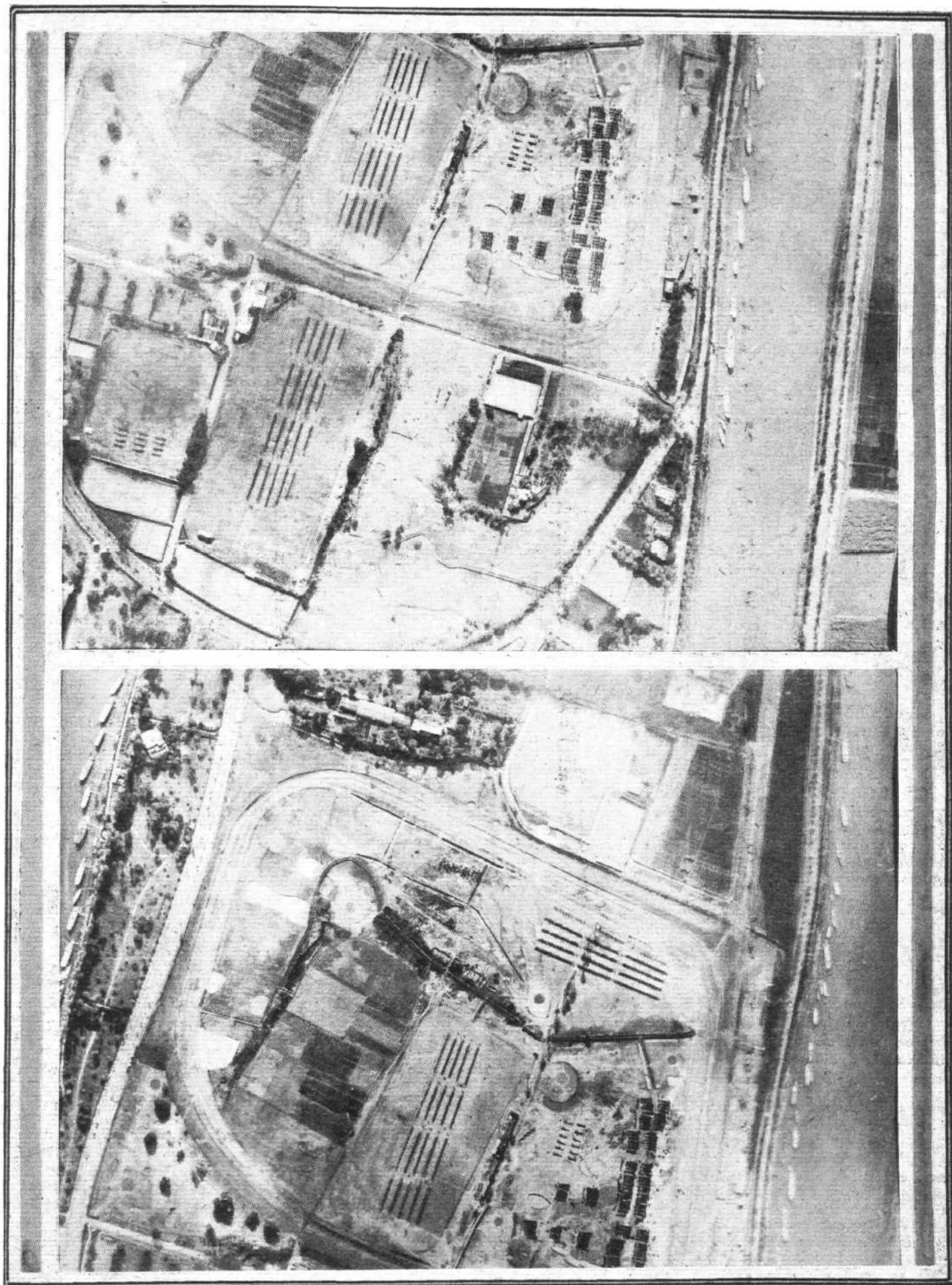
We must say that we view the present position with the gravest apprehension. There is only a short two months left before the determination to scrap the whole of the airship material must take effect. It is difficult under all existing conditions to blame the Air Ministry or the Government for what is happening. The offer we have been discussing has been open for a considerable time, and nobody has taken advantage of it, though there have, we are given to understand, been several nibbles. In fact, there is only one question we should like answered in connection with the matter, and that is: Has every necessary step been taken to interest Dominion Governments and capitalists in commercial airship services? We are quite aware of the fact that it is no business of the British Government to endeavour to obtain capital for such schemes as this—normally, that is. But it is evident from the terms of the Government offer that there is a considerable amount of anxiety present in the minds of authority to keep the airship services in being. On the grounds of economy alone, it has been decided to scrap the airship side of the Air Force. That is a fact. Economy, and economy alone, has been responsible, although in the long-run it may turn out to be very false economy. The Admiralty were consulted in the matter, and their decision was that the airship service was perfectly sound as an auxiliary to the Fleet, but that they would rather have all heavier-than-air craft if there was only a certain amount of money available.

In view of the present state of trade and industry we cannot feel very surprised that there should be difficulty in getting together the necessary capital to take over the ships and operate them. The golden time was twelve or eighteen months ago, when business was booming, and there was plenty of money for investment. Then, however, the Government did not display the same anxiety as it shows now to get airship services established. It is only recently that the abandonment of the airship as a war machine on the grounds of economy has prompted the Air Ministry to go out on a serious effort to keep the ships in commission for commercial purposes. At this late stage it seems to us that if this is to be done it is only with the assistance of the Dominions, which, even more than ourselves, should be interested in the development of airship transport. Sir Frederick Sykes, at a conference with representatives of the Press last Monday, said that it was his intention to discuss the whole question with the Dominion premiers during their forthcoming visit to England. It is possible to hope that something may come of the discussion, but we seriously suggest that it is a bit late in the day. In the meantime, is it not possible that some powerful group of capitalists can be got together to find the money to take over the ships and operate them?

Traffic Control by Aircraft

This year's race for the Derby produced an altogether new and most interesting experiment in traffic regulation. As everybody knows, the immense volume of traffic to and from Epsom on the day of the race grows year by year, and has taken on a magnitude which has taxed the resources for regulation of the police to the breaking point. The scenes and the congestion along the various roads leading to Epsom Downs have

The Camera and the 'Plane



REVIEW OF THE 10th DIVISION ON GEZIRCH ISLAND RACE-COURSE (ON THE NILE), TAKEN AT 4,000 FEET: The Division is seen set out in three brigades, two of which (of four battalions each) are shown in the top view, on the left, with the Divisional Transport to the right. The third brigade (of three battalions, the fourth being on "duty") is shown in the lower view above the Divisional Transport, which is again recorded. Note the house-boats by the river bank on each side of the island in this view (also seen on the right in the top view).

been described as a disgrace to the authorities responsible for traffic control. We do not altogether agree with this point of view. What is at fault is that hitherto the subject has not been approached scientifically, and with a view to the adoption of new methods to what practically, through the enormous growth of road transport in recent years, is a new situation.

This year the matter seems to have been regarded from a new angle of view, and, to begin with, the traffic was compelled to proceed on "one way" roads, while certain highways were kept for motor traffic alone, others being reserved for the slower-moving types of vehicles. But the most interesting innovation was the use of aircraft to assist in the regulation of traffic. Aeroplanes were used for the purpose of photographing the traffic at various points of the routes, in order to form a graphic record for the use and information of the authorities. R. 33 was used as a signal station, wirelessly to a station erected in the grand stand at Epsom news of any happenings of note or of great congestion at particular points in order that the police might be able without delay to modify their arrangements for control.

What degree of success attended these experiments we do not as yet know, since at the moment of writing no statement has been issued regarding the view taken of the innovation by the authorities. But even if no particular success had been achieved—which was not at all the case—we should still regard the experiment as of superlative interest, if only because it denotes a receptivity of mind on the part of the police authorities which is quite in keeping with the spirit of the times and a recognition of the potential value of aircraft for all sorts of hitherto unsuspected uses. Passing to the lighter side of the matter, we cannot help wondering what our grandfathers who attended the Derby in Hermit's year would have said if they had been seriously told that, if they lived long enough, they would be shepherded on their way to Epsom by aircraft? We doubt if the old gentlemen's language would have been as polite as it was likely to have been forcible. One need not go as far back as that, though. If the Derby crowd of 1911 had been told that in ten years' time they would actually see what happened on Wednesday, they would have expressed equally impolite disbelief. We certainly live in times which move rapidly in certain directions.

THE LONDON-CONTINENTAL SERVICES

FLIGHTS BETWEEN MAY 22 AND MAY 28, INCLUSIVE

Route†	No. of flights*	No. of passengers	No. of flights carrying		No. of journeys completed†	Average flying time	Fastest time made by	Type and No. (in brackets) of Machines Flying
			Mails	Goods				
Croydon-Paris ...	31	121	4	17	30	2 36	Spad F-CMAV (2h. 1m.) ...	B. (5), Bt. (1), D.H.18 (1), G. (4), Sa. (1), Sp. (7), V. (1).
Paris-Croydon ...	30	124	18	21	28	2 58	Spad F-ACMG (2h. 11m.) ...	B. (4), Bt. (1), D.H.18 (1), G. (3), Sp. (7), V. (1).
Cricklewood-Paris ...	4	40	2	3	4	3 12	H.P. G-EATK (3h. 5m.) ...	H.P. (3).
Paris-Cricklewood ...	4	29	—	3	4	3 11	H.P. G-EATM (3h. 0m.) ...	H.P. (3).
Croydon-Brussels ...	6	6	5	3	6	2 25	D.H.4 O-BADU (1h. 52m.) ...	D.H.4 (2), D.H.9 (2).
Brussels-Croydon ...	6	11	5	5	5	2 31	D.H.4 O-BARI (2h. 5m.) ...	D.H.4 (1), D.H.9 (2).
Croydon-Amsterdam ...	7	8	6	6	7	3 57	D.H.9 H-NABO (2h. 49m.) ...	D.H.9 (1), F. (5).
Amsterdam-Croydon ...	7§	15	6	5	5	3 40	D.H.9 H-NABO (2h. 33m.) ...	D.H.9 (1), F. (5).
Totals for week ...	95	354	46	63	89			

* Not including "private" flights.

† Including certain journeys when stops were made *en route*.

‡ Including certain diverted journeys.

§ One to/from Rotterdam.

Av. = Avro. B. = Breguet. Br. = Bristol. Bt. = B.A.T. D.H.4 = De Havilland 4, D.H.9 (etc.).
 F. = Fokker. Fa. = Farman F.50. G. = Goliath Farman. H.P. = Handley Page. N. = Nieuport. P. = Potez.
 Sa. = Salmson. Se. = S.E.5. Sp. = Spad. V. = Vickers Vimy. W. = Westland.

The following is a list of firms running services between London and Paris, Brussels, etc., etc.:—Co. des Grandes Expresses Aériennes; Handley Page Transport, Ltd.; Instone Air Line; Koninklijke Luchtvaart Maatschappij; Messageries Aériennes; Syndicat National pour l'Étude des Transports Aériens; Co. Transaérienne.

King and Queen of Belgium Arrive by Air

AGAIN King Albert and his Queen have selected, *via* the air, to visit this country. About 7 p.m. on May 29 the Royal couple arrived from Brussels at Hawkinge Aerodrome near Folkestone, in different machines piloted by Belgian officers. The machines were of the D.H. type, and belonged to the Belgian Flying Corps. They had flown from Brussels, and made an excellent landing.

The Royal visitors were received by the officer commanding and a guard of honour of the R.A.F., and almost immediately after proceeded to Dover by motor-car. They stayed the night at Dover and the next day motored to Portsmouth, where they visited their son, Prince Charles, who has just joined H.M.S. *Thunderer*. Two British flying boats from Portsmouth reached Dover on the same day to act as escort. There was a very strong easterly wind in the Channel during the cross-seas flight. Subsequently, the weather was so bad that one of the escorting flying boats broke from its moorings

at Dover on Monday and drove ashore on the beach. Flying Corps men and a naval pinnace quickly arrived, a long hawser was got aboard the Government steamer *Kilmun*, and the flying boat was safely hauled afloat. Their Majesties returned by air on Tuesday.

Independent Force (R.A.F.) Third Annual Dinner

THE Third Annual Reunion Dinner of the Independent Force, including all officers of Army troops and all other attached units, will be held at the Hotel Cecil on Monday, June 20, 1921, at 7.30 p.m. for 8 p.m.

Air-Marshal Sir H. M. Trenchard, Bart., K.C.B., D.S.O., A.D.C., will preside, and H.R.H. the Duke of York has graciously signified his intention of being present.

Evening dress with miniatures will be worn.

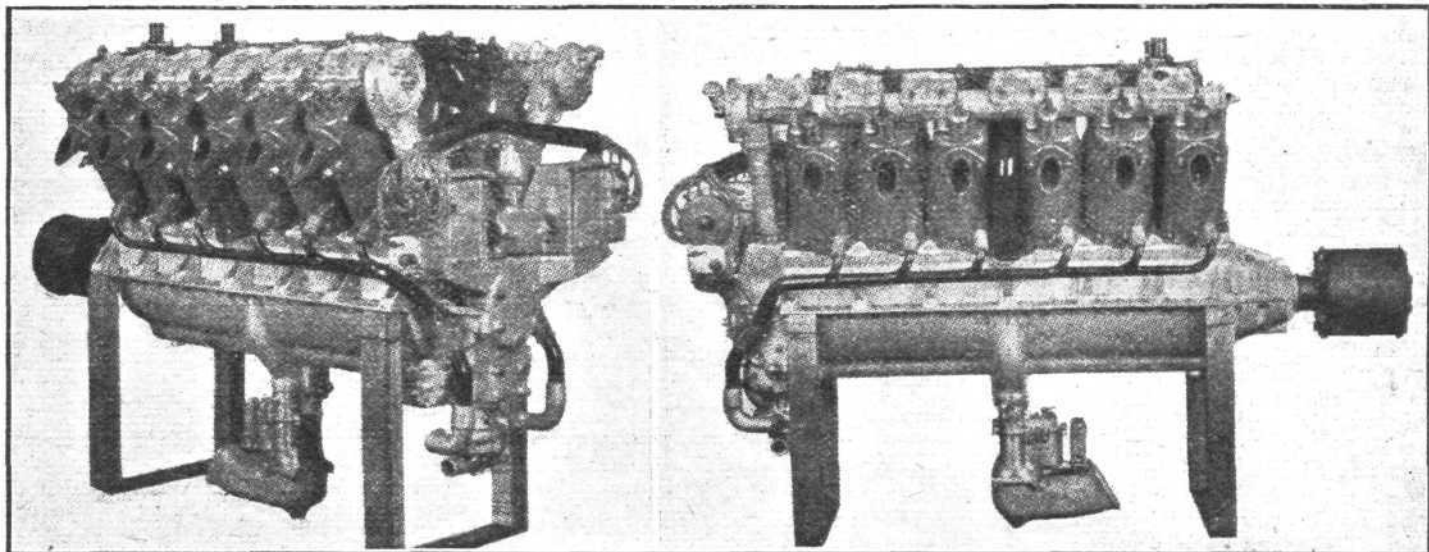
Tickets, price 17s. 6d. (excluding wines), may be obtained by any eligible officers from the hon. secretaries, Major T. Vincent Smith, M.C., or Sq.-Ldr. S. M. Cleverly, c/o Room 337 E, Alexandra House, Kingsway, W.C.2.

THE PACKARD "ALTITUDE" AERO ENGINE

By Col. J. G. VINCENT, Vice-President of Engineering, Packard Motor Car Co.

AN aero engine specially designed for use at high altitudes has recently been completed for the U.S. Army Air Service. It is one of the first American aero engines in which an effort has been made to offset the difficulties experienced with ordinary engines at high altitudes. The design was completed in the Packard shops, and the engine is known as the Packard "1237." That its performance will considerably

To increase the efficiency of the aero engine at high altitudes the first necessity was to increase the compression ratio, by which means it becomes possible to maintain the output even at considerable heights, due to the improved thermal efficiency. Again, since the engine is designed for normal work at high altitudes, it is possible to make the cylinders larger in proportion to the rest of the working



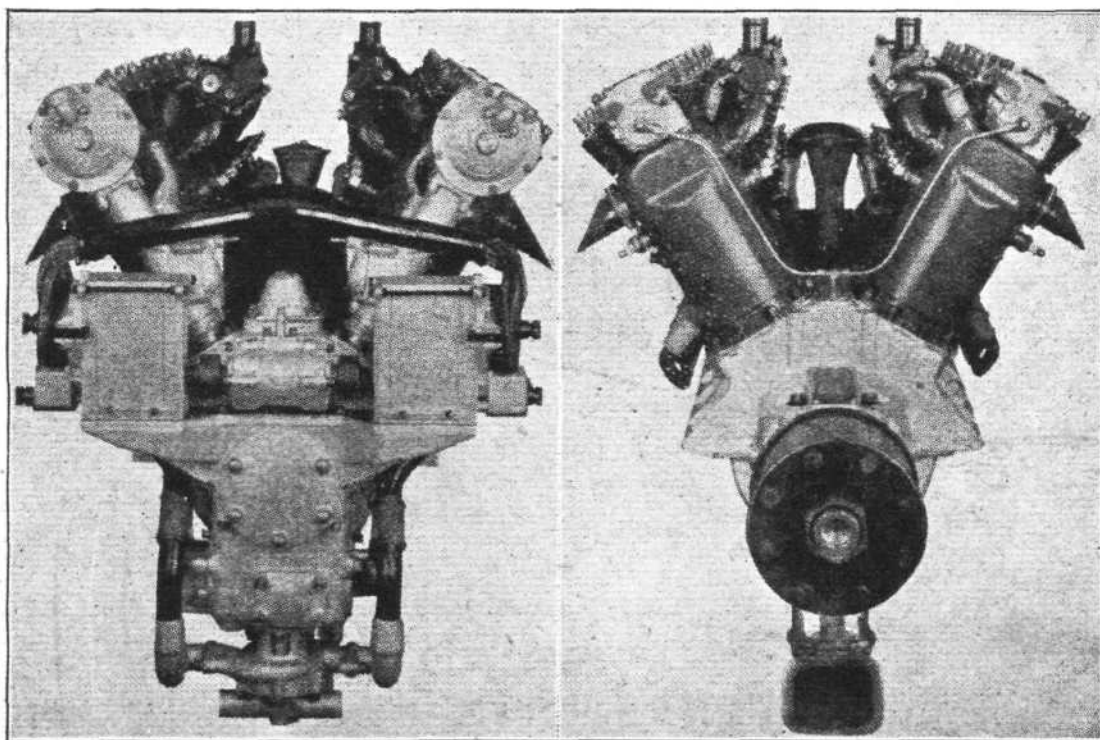
THE PACKARD "ALTITUDE" AERO ENGINE: Three-quarter and side views.

exceed the specifications laid down is indicated by the preliminary tests, which have been entirely satisfactory.

Although aero engines are used fully 90 per cent. of the time at altitudes above 5,000 ft., it has nevertheless been the practice in the past to judge such engines almost entirely on the basis of their ground performance. This has resulted in a tendency to design those engines for most efficient work at the low altitudes at which they are used only in the first

parts, as the stresses on the latter are far less than would be the case at sea level with cylinders of the same size. Thus, the "1237" is built "oversize."

In designing this engine the Packard Engineering Department took as standard its "1116" engine—a successful post-War model which incorporated many valuable features learned from war experience, and which ran with exceptional freedom from vibration up to speeds above 2,400 r.p.m.



The Packard "Altitude" Aero Engine: Magneto (left) and propeller (right) end views.

10 or 15 minutes of a flight. In the "1237" engine, therefore, features have been introduced that might not be wholly satisfactory on the ground, but that would become unusually so at points above 5,000 ft.

After the mechanical features of this engine were thoroughly proved, it was decided to put the finishing touch to the design by increasing the compression and making the cylinders $\frac{1}{4}$ in. larger in diameter with a view to obtaining

efficiency of operation at altitudes never before obtained with such an engine. This was accordingly done, raising the cylinder displacement to 1,237 cubic ins.

It had originally been decided not to attempt to test this engine on full throttle at sea level since the increased stresses might be more than the engine could be expected to stand. It had been the intention, of course, to supply the engine with a safety stop on the throttle until an altitude of at least 5,000 ft. should be reached; then the throttle could be opened wide.

However, the engine behaved so well in its trial run on the dynamometer that it was decided to attempt a wide-open throttle run. The results were extremely gratifying, and the engine showed itself capable of being run under these conditions at speeds in excess of 2,400 r.p.m. A maximum of 400 h.p. was developed although the engine was originally designed for only 300 h.p. This run was made on ordinary aviation petrol, and the engine did not suffer from either pre-ignition or detonation. This is in marked contrast to somewhat similar oversize engines constructed in Germany which cannot be run wide-open near the ground except with doped fuels.

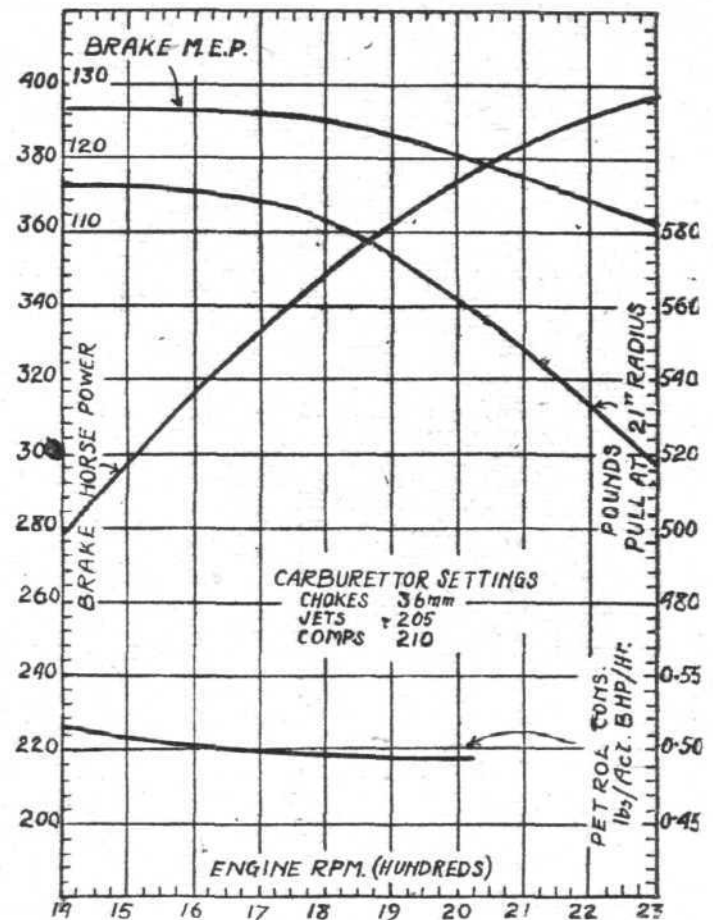
While it is not intended that the "1237" engine is to be run wide-open near the ground for any long period, it is extremely gratifying to know that this excess of power is available for taking off with a heavily loaded machine.

In its general design the "1237" follows the lines of other Packard aero engines developed since the War, and it is of the twin-six type with the cylinder bank set at an angle of 60°, with overhead valves and an arrangement of accessories giving the greatest possible accessibility. The crankshaft is of the now generally accepted type where a main bearing is provided on each side of each connecting rod, and all bearings carefully proportioned to give uniform life. The crank cheeks are of oval section, giving the best combination of rigidity with minimum weight. The diameter of the main bearings is 2½ ins., and their length as follows: No. 1, 1½ ins.; Nos. 2, 3, 5 and 6, 1¼ ins.; No. 4, 3 ins.; No. 7, 4½ ins.

The connecting rods are of the straddle type, suitably proportioned. The pistons are of aluminium alloy, die-cast and equipped with floating rings; three compression rings are fitted above the piston pin, and one scraper ring below it. The latter and its groove have been found in actual service to be extremely efficient in preventing excessive oil pumping.

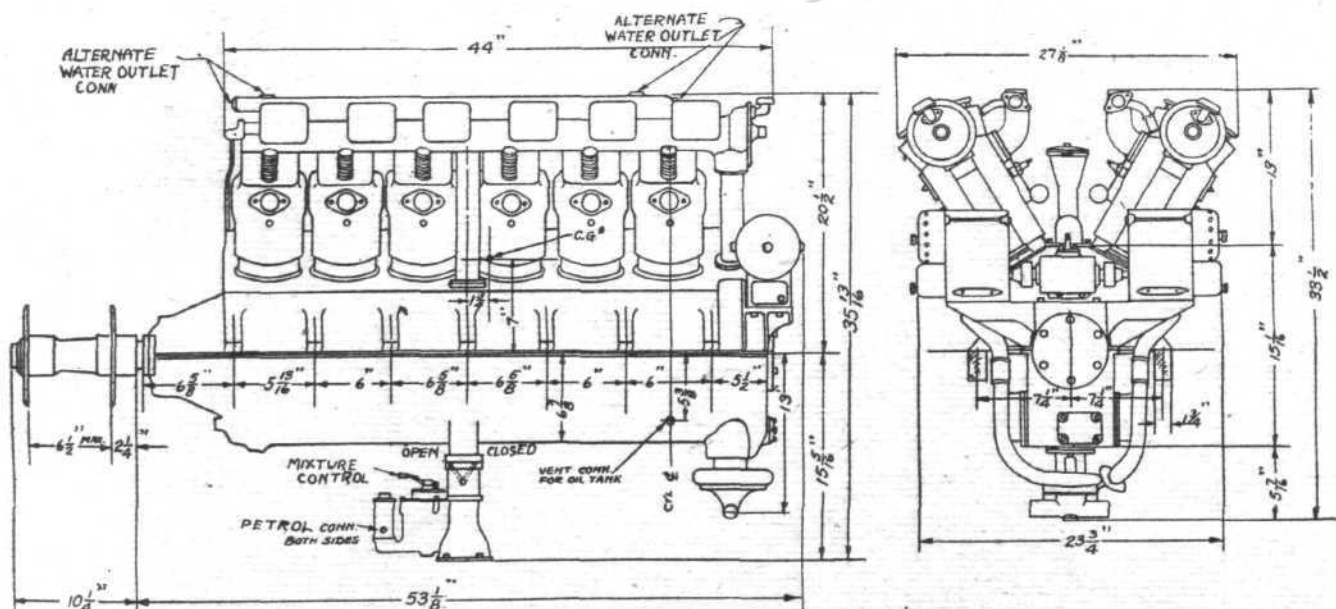
The standard compression ratio is 6½ to 1, but pistons giving a 5½ to 1 ratio can be fitted for low altitude work. The propeller hub is of the detachable type, carefully designed to prevent the propeller from either freezing on the shaft or becoming loose. The crankcase is of box section design,

camshaft and rocker arm assemblies are of the enclosed type developed by Packard and used so successfully in the Liberty engine. A tachometer drive is provided on the end of each camshaft, permitting the installation of a tachometer in each of the two cockpits if desired.



THE PACKARD "ALTITUDE" AERO ENGINE :
Performance curves.

The lubricating system is full pressure feed, operating with a dry pump, and it contains many improvements indicated by long experience. The oil pump and oil screens are readily



THE PACKARD "ALTITUDE" AERO ENGINE : Side and end elevations, showing principal dimensions.

parted on the centre line of the crankshaft with the main bearings carried between. Great rigidity is obtained by means of long through bolts which unite the two halves.

The cylinders are of the individual steel type, and the valves are 2 ins. diameter in the clear with 30° seats, the intake valve lift being 7/8 in. and the exhaust 3/8 in. The

accessible for examination and adjustment. A tapped boss is provided in the crankcase to serve for the oil tank vent. The engine is designed especially for the use of a nose radiator, but is equally adaptable to any other type of radiator. The water pump is located under the rear end of the engine, and the water outlet connections can be carried to four different

directions, depending on the installation requirements, without any change in the standard engine. A tapped boss is provided for the insertion of a standard distant type thermometer to register the outlet water temperature.

The engine is equipped with a single duplex Packard-Zenith carburettor of the single Venturi type mounted underneath the engine. In addition to making it very accessible, this provides for gravity feed. It also insures the greatest possible protection from fire, all vents being carried outside of the cowling so as to eliminate any such possibility from back fire. The use of a single float-chamber for a multiple-cylinder engine has been found to give the best results from the standpoint of uniform distribution and maximum economy. The single carburettor was something of an experiment, but the difficulty of synchronising two or four carburettors for throttle as well as altitude control was so great that it was decided to make the attempt, since it, of course, obviates these difficulties. Data which tests have given us in regard to power output, petrol economy and inlet manifold depression show a very satisfactory result, and it is extremely doubtful whether two or four carburettors could have given as good results.

The location of the carburettor, in addition to its greater accessibility and safety from fire hazard, is also a great

advance from the point of view of installation and maintenance. The gravity feed simplifies the whole system, and the change is one which certainly should commend itself at once to aero engine designers. An improved design of mixture control valve of the McCook Field type is used, which gives uniform action and consistent results.

Standard ignition equipment consists of two 12-cylinder Dixie magnetos with fixed spark advance. A Vernier type magneto coupling permits the magnetos being properly set and synchronised in a minimum length of time. The magnetos are interchangeable—that is, they revolve in the same direction. Complete double ignition to two sets of spark plugs is provided, and the engine will function properly on either set.

The standard engine has provisions for taking the following accessory equipment without any changes: Rear end electric starter, petrol pump, gun synchroniser drive and generator drive.

The total weight of the engine, dry, is 735 lbs., and on the maximum development of 308 h.p. output this gives a weight of 1.85 lbs. per h.p. The petrol consumption with wide-open throttle averages almost exactly $\frac{1}{2}$ lb. of fuel per h.p. hour. The accompanying graph gives further details in regard to the performances of the engine on the dynamometer.

ROYAL AERONAUTICAL SOCIETY NOTICES



French and English Glossary.—A number of copies of the Glossary of Aeronautical Terms prepared by the Society, with French translation in parallel text by Capt. L. F. Plugge, Fellow, have been received from the Air Ministry, to whom the Society assigned their copyright for the purpose of this issue. Members who wish to obtain copies of this Glossary should apply to the Secretary.

Representatives on other Bodies.—The following Members have been appointed to represent the Society on various other scientific bodies and committees:—

Joint Standing Committee with the S.B.A.C.—Chairman (*ex-officio*), Vice-Chairman (*ex-officio*), Dr. Bairstow, Wing-Comdr. Cave-Browne-Cave, Lieut.-Col. A. Ogilvie,

Lieut.-Col. M. O'Gorman and Maj.-Gen. Sir R. M. Ruck.

British Engineering Standards Association, Aircraft Main Committee.—Lieut.-Col. M. O'Gorman.

B.E.S.A., Aircraft Sub-Committee No. 1 (Nomenclature).—Dr. Bairstow, Maj. Low, Lieut.-Col. M. O'Gorman, Dr. Sutton Pippard, Mr. Southwell, and the Secretary. *Aeronautical Research Committee.*—Lieut.-Col. A. Ogilvie. *Conjoint Board of Scientific Societies.*—Lieut.-Col. M. O'Gorman.

Library.—The following books have been received and placed in the Library:—"Automobile and Aircraft Engines," by A. W. Judge; "Aeroplane Performance Calculations," by Harris Booth. W. LOCKWOOD MARSH
Secretary

ADVISORY COMMITTEE REPORTS

The following is a list of Reports published by the Aeronautical Research Committee during February, March, and April, 1921; they are obtainable from H.M. Stationery Office:—

Aeronautical Research Committee

REPORTS AND MEMORANDA.

680. Distance required to take off an Aeroplane. (With Diagrams.) June, 1920. Price 6d.

682. Modification of the Performance of an Airscrew due to the Proximity of a Plane Surface; also Experiments with the same Model Airscrew when mounted behind a Model of a Power Car of Airship "R.32." (With Diagrams.) September, 1920. Price 4d.

683. Experiments with Full-sized Machines. Second Series. (With Diagrams.) September, 1920. Price 4d.

685. Aeroplane Instruments. Forced Vibrations in. (With Diagrams.) April, 1920. Price 3d.

686. Tests of Four Aerofoils suitable for Airscrew Design. (With Diagrams.) July, 1920. Price 3d.

687. S.E. Aeroplane with Modified Control Surfaces.

Experiments on an. (With Diagrams.) September, 1920. Price 4d.

688. Effect of Fairing the Nose of an "S.E.5" Fuselage. Experiments on. (With Diagrams and Plates.) September, 1920. Price 6d.

702. Some Tests on Navigation Instruments during a Flight of Rigid Airship "H.M.A.R.33." (With diagrams.) September, 1920. Price 2d.

703. Metallic Couplings for Petrol Pipes. (With Diagrams.) December, 1920. Price 4d.

704. Comparative Performance of various Airscrews for S.E.5A, with Wolseley Viper Engine. (With Diagrams.) November, 1920. Price 1s. 6d.

Aircraft and Aircraft Engines. Report on the Materials of Construction used in. Price 21s.

Technical Report for 1917-18. Vol. I. Model Work. Price 21s.

[Previous lists appeared in FLIGHT, July 3, 1919; October 23, 1919; February 19, 1920; April 22, 1920; May 13, 1920; August 19, 1920; December 2, 1920; December 30, 1920; February 10, 1921; May 26, 1921.]

A Bristol Fighter in Honduras

News to hand from Tegucigalpa states that the first aerial flight in the Republic of Honduras has been effected by a British pilot on a British aeroplane. The machine was a "Bristol" Fighter, type F. 2 B, and the route traversed was between San Pedro Sula and Tegucigalpa, a distance of some 200 miles. The time occupied in the flight was 1 hour 37½ minutes, an average speed of 110 m.p.h., and it is interesting to record that in the course of the flight an altitude of 18,000 feet was attained.

Levee at St. James's Palace

At the Levee held by His Majesty the King at St. James's Palace on Monday, May 30, amongst those in attendance on His Majesty was Air-Marshal Sir Hugh M. Trenchard, K.C.B., D.S.O., Principal Air Aide-de-Camp, and in attend-

ance on H.R.H. the Duke of York, was Wing-Comdr. Louis Greig.

Amongst those who attended the Levee was Capt. the Hon. F. E. Guest, C.B.E., D.S.O., M.P., Secretary of State for Air. The following were amongst those presented to H.M. the King:—Flight-Lieut. B. Adamson, Flight-Lieut. F. Barrington, Flight-Lieut. C. Bartlett, D.S.C., Flight-Lieut. E. Beulah, Flying-Officer J. Bentham, Flight-Lieut. R. Compton, D.S.C., D.F.C., Flight-Lieut. R. Dickey, D.S.C., Flying-Officer N. Dixon, A.F.C., Flight-Lieut. H. Fellowes, Flying-Officer C. Godfrey, Sqdn.-Ldr. A. Grant, M.B.E., Flight-Lieut. G. Hall, A.F.C., Sqdn.-Ldr. E. St. Clair Harnett, O.B.E., Flight-Lieut. G. Hooper, M.C., D.F.C., Flight-Lieut. W. Longton, D.F.C., A.F.C., Flight-Lieut. C. Mackay, M.C., D.F.C., Flight-Lieut. R. Addenbrooke-Prout, O.B.E., Flight-Lieut. F. Stammers, O.B.E., Sqdn.-Ldr. A. W. Tedder, and Flying-Officer N. Ward.

DISPOSAL OF AIRSHIPS:

Terms of Government Offer

IN connection with the policy of the Government announced in the House of Commons on the introduction of the Air Estimates to give up airships if they were not taken over by private persons for commercial purposes, the Air Ministry announces that this has been further considered, and it has been decided that unless a firm offer is received before August 1, all airship activities under the Air Ministry will be discontinued and airships, stations, and material will be handed over for disposal to the Disposals Board, as the Air Ministry does not feel justified in continuing expenditure on this service.

Neither this decision nor the previous one to discontinue the Airship Service of the Royal Air Force, which was arrived at after consultation with the Admiralty, should be taken as deprecating in any way the commercial possibilities of lighter-than-air craft. Both have been dictated by the urgent need for economy.

Some of the airships in the possession of the Air Ministry are employed on trials conducted by the Civil Aviation Department, some are laid up, one is partly completed, although construction work has been stopped, and one is being temporarily employed in connection with the training of the U.S. personnel for the airship which is under construction for the United States Navy. The trials will be continued by the Air Ministry until the end of July next, and it is intended, in addition to the tests which have been carried out for some months past with the mooring mast at Pulham Airship Station, to arrange during the intervening period a series of demonstration cruises for the benefit of those who may contemplate the acquisition of the airships.

The material available under the Government offer is as follows:—

1. *Airships*.—R. 80, R. 33, R. 36, R. 37 (80 to 90 per cent. completed), and L. 64, L. 71 (ex-German).

These airships, with the exception of the two ex-German ships, are equipped with bow mooring arrangements, and are ready to operate under commercial conditions from a mooring mast.

The two ex-German airships, although otherwise in good condition, require new gasbags and are not fitted with bow mooring gear.

R. 36 is the only airship already fitted with a passenger car, but the others can be similarly equipped without difficulty at a comparatively small cost.

The performances of R. 36, R. 37, L. 64 and L. 71 on a 750-mile flight are estimated to be as follows:—

	R. 36 and R. 37.	L. 64.	L. 71.
Passengers carried ..	30	40	60
Freight carried ..	2 tons	9 tons	15 tons
Time for journey ..	15-18 hours	15-18 hours	15-18 hours

2. *Airship Material*.—A large quantity of spare engines, fabric, gasbags, station equipment, and general spares and stores for the above airships.

3. *Airship Stations*.—*Cardington*.—This station, which is situated about three miles from the town of Bedford, has all the necessary equipment and plant for the construction and repair of airships.

The workshops comprise:—Engineering shop, tool room, press room, etc., girder shop, woodworking machine shop, sheet metal workshop, fabric and doping shops, foundry, forge, smith's shop, etc. The station has excellent railway and other communications, and is supplied with electric power. An up-to-date hydrogen plant is installed, the capacity of the gas holders being about 1,000,000 cubic feet.

There is one airship shed sufficiently large to enable a

ship of the latest type to operate. In certain conditions two ships can be housed therein.

Other works on the station include a W/T installation, meteorological hut, garage, store accommodation, offices, etc.

The aerodrome covers an area of 1,064 acres, of which 45 acres are occupied by the shed and buildings, and in addition there is a model village adjoining the site, which accommodates 150 families.

Skilled labour is readily obtainable in the neighbourhood of the station.

This station would form a valuable asset to a commercial company. The ease with which it can be reached from London makes it a convenient site for an operation base, and its workshops make it suitable for a repair depot.

It would, however, be necessary to erect a mooring mast.

Pulham, Norfolk.—This station, which is about 16 miles south of Norwich, is equipped as an operation base. It is complete with a large gas plant (capacity of holders over 1,500,000 cubic feet), power plant, repair workshops, wireless station, meteorological hut, etc.

A standard gauge railway track runs on to the site from the Great Eastern Railway.

There are two rigid airship sheds capable of housing three ships of the latest type. There is an operational mooring mast 100 feet high on the aerodrome.

The area of the aerodrome is 920 acres, of which the sheds and buildings occupy 56 acres.

Hut accommodation exists on the station for several hundred men.

Overseas Base.—A shed 800 feet long and all necessary equipment are in existence (in this country), and are available for the erection of a base overseas.

The Government's Offer

Before receiving a concrete proposal it is not possible for the Air Ministry to state definitely the detailed terms on which the material referred to above would be made available for a company, but the following would form a basis for discussion:—

The Government would:—

(a) Hand over *free* the R. 80, R. 33, R. 36, R. 37, and the ex-German airships, L. 71 and L. 64, as they now stand.

(b) Hand over *free* all other airship material, such as equipment, stores, plant and spares appertaining to airships and airship stations, including any German airship material received under the terms of the Peace Treaty, and the shed and equipment for an overseas base mentioned above.

(c) Place at the disposal of the company all available technical airship information and data.

(d) Place at the disposal of the company all pertinent information in the possession of the Air Ministry in wireless telegraphy, meteorology, etc., and the results of airship experimental work.

(e) Second (lend) to the company for a limited period such specialist airship personnel (to be paid by the company) as the company may require to operate and maintain the material taken over.

(f) Sell or lease to the company, on terms to be agreed, Cardington and Pulham Airship Bases complete with all equipment, stores and plant as they now stand.

The Requirements of the Government.—The Government would require from any company accepting the above terms, an agreement that:—

(a) The capital of the company will be controlled by British shareholders.

(b) The Air Ministry will be represented on the Board of Directors.

(c) All material will be utilised for the development of Airship transport.

(d) None of the material handed over (without consideration) by the Government will be disposed of by sale or free gift, except by permission of the Government.

(e) In the event of the company going into liquidation and being still in possession of the Government assets so handed over, the market value of such assets over and above any capital loss sustained by the company will revert to the Government, if the Government so desire.

Airship Performances

Ship.	R. 33.	R. 80.	R. 36 and R. 37.	L. 64.	L. 71.
Overall—	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
Length	639 5	535 0	672 2	642 6	743 0
Diameter	78 9	70 0	78 9	78 5	78 6
Height	91 7	85 0	91 7	—	90 0
Volume of capacity (cu. ft.)	1,958,600	1,200,000	2,101,000	1,972,000	2,420,000
Total lift (tons)	59.4	36.4	63.8	59.9	73
Weight of hull and fittings ..	36.3	21.6	37.8	23.9	28
Number of engines	5	4	5	5	6
Total horse-power	1,250	920	1,570	1,300	1,560
Maximum speed ..	60 m.p.h.	60 m.p.h.	65 m.p.h.	70 m.p.h.	75 m.p.h.

A propos of the foregoing, the following notes, issued by the Air Ministry, on foreign commercial airship activities are of interest.

United States of America.—Apart from the R. 38 bought by the U.S. Navy Department, from the British Government—and which, it is hoped, will be flown across the Atlantic this summer—and the Italian semi-rigid airship "Roma" purchased for the Army, there is very little airship activity at present in the States, and only a few small non-rigid airships in commission.

A rigid airship similar in design to the German L. 49 class is, however, being constructed at Lakehurst, New Jersey. It is anticipated that this ship will be completed during 1922.

At Lakehurst, New Jersey, a large shed is nearing completion, which, being 1,000 ft. by 265 ft. by 174 ft. high, will be large enough to accommodate an airship of 10,000,000 cubic ft. capacity, or two ships of five million cubic ft.

At Cape May, a shed 706 ft. by 110 ft. by 107 ft. is being erected, and at Langley Field a shed 420 ft. by 125 ft. by 113 ft. is to be extended to 750 ft. long. The erection of a large base on the Pacific Coast is also contemplated.

A plant for the production of helium on a large scale is now in operation at Fort Worth, Texas.

A company termed the "General Air Service Company" is being formed for the purpose of operating commercial airships on trans-continental and trans-oceanic routes. Its organiser is Mr. Hardesty, and among its supporters are the General Electric Co., Mr. Sieberling of the Goodyear Company, and several bankers. The services of Dr. Schutte, formerly of the Schutte-Lanz Company, have been secured as technical expert. The capital being raised is 50 to 100 million dollars.

France.—It is understood that one of the two surrendered German Zeppelins (L. 72 and LZ. 113) is to be used for commercial purposes.

At Cuers, near Toulon, one shed 738 ft. by 131 ft. by 131 ft. is completed, and a second shed of the same dimensions is under construction. At Maubeuge, there is a shed 737 ft. by 106 ft. by 131 ft. constructed by the Germans, and at present used for accommodating LZ. 113. A large gas plant is being installed.

Seven of the German airship sheds allocated to France under the terms of the Peace Treaty are being dismantled with a view to their re-erection in France and the Colonies. It is understood that they will probably be erected at Marseilles, Paris, Tunis, Casablanca, and Algiers.

Information has been received from the French Government that they propose to erect mooring masts at Paris and Cuers. These masts will be of similar design to British masts, and facilities for the use of them by British commercial airships will be afforded.

Approximately 47,000,000 francs was allocated for work in connection with airships, airship stations, etc., in the French estimates for 1921.

Germany.—Germany has been allowed to retain four airship stations with sufficient gassing arrangements for International civil aviation. These are:—Lowenthal (Friedrichshafen) Staaken (Berlin), Nordholz (Frisian N.W. Coast), Seddin (Baltic Coast). The Zeppelin Company has also been allowed to retain all its factories intact, with the exception of the large airship erection shed.

There is little doubt that when the restrictions on aircraft construction are removed, Germany will be able to construct commercial airships with a considerably better performance than any in existence at present, and at smaller cost. During 1920, negotiations were opened with the American air service for the construction by the Zeppelin Company of an airship of $3\frac{1}{2}$ million cubic ft., with a maximum speed of 91 m.p.h., and a disposable lift of 69 tons. The cost of this ship was to be 500,000 dollars. Negotiations were broken off owing to the relations existing between the American and German Governments.

Italy.—The Navy has cut down its airship forces to a minimum, retaining only one large airship station in commission and six in reserve.

The military department has retained the big experimental and constructional works at Rome. A total of three airship stations are kept in full commission and five in reserve.

The close connection existing between the Naval and Military airship forces during the War has been extended to include the civil aviation department, and a certain number of passenger flights have been carried out by service aircraft for the benefit of the civil side.

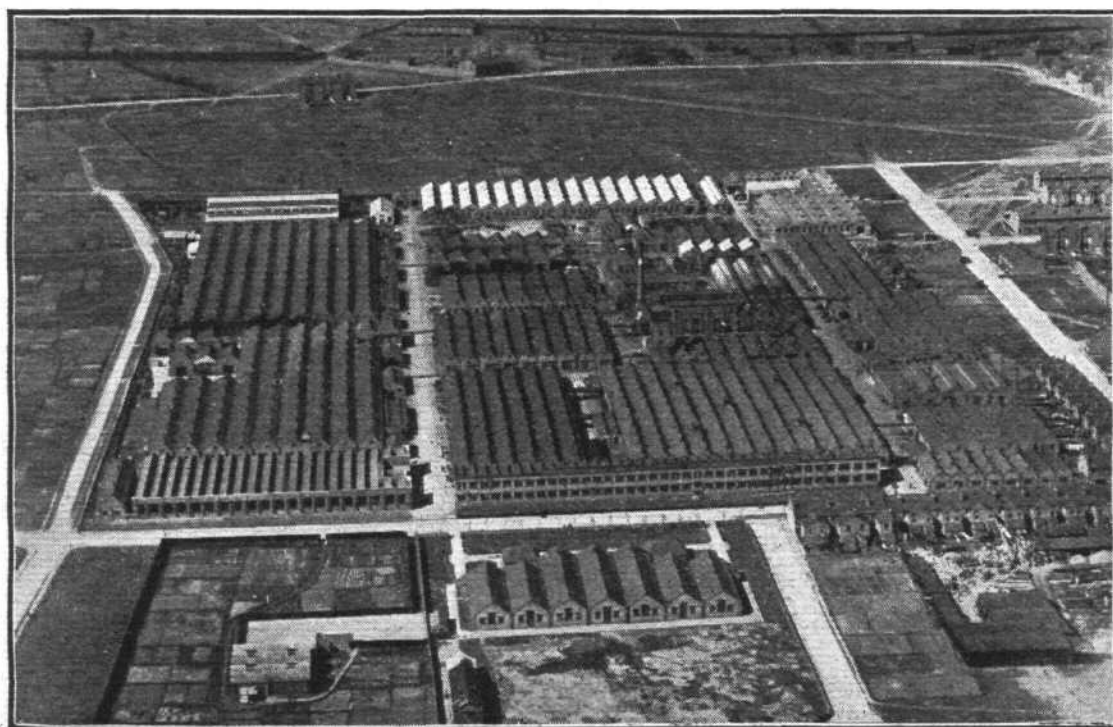
Airship M. 1 was equipped with a passenger car soon after the Armistice, and was constantly in operation until it was made obsolete and scrapped in September, 1920. In August, 1920, airship M. 14 was being fitted with a passenger car and airship F. 6 was similarly fitted.

Very little appears to have been done during the latter part of 1920.

Japan.—An airship shed from Juterbog which has been allocated to Japan is being dismantled, and is to be re-erected near Tokyo. This shed is 787 ft. long, and 213 ft. wide. Specimen parts of the German airship L. 37 are being despatched to Japan for examination.

Sweden.—The Swedish Air Traffic Company is considering the establishment of airship routes between Stockholm and Berlin, London and Petrograd. In 1920, the Company was granted a subsidy of 1,750,000 kroner by the Swedish Government for the erection of an airship base at Arstadal, near Stockholm. Capt. Jacobsen, a representative of the Company, has recently been studying airship development, and mooring mast experiments in this country.

During the operation of the "Bodensee" in 1919, a successful demonstration flight to Stockholm was made, passengers and goods being carried.



An "Aerial" of the famous Rolls-Royce factory at Derby: The photograph shows the compact nature of this great motor-car and aero motor factory. It has been calculated that if all the bays were placed end to end in one straight line, they would extend to 5 miles 515 yards. The average width of the bays is 22½ feet.

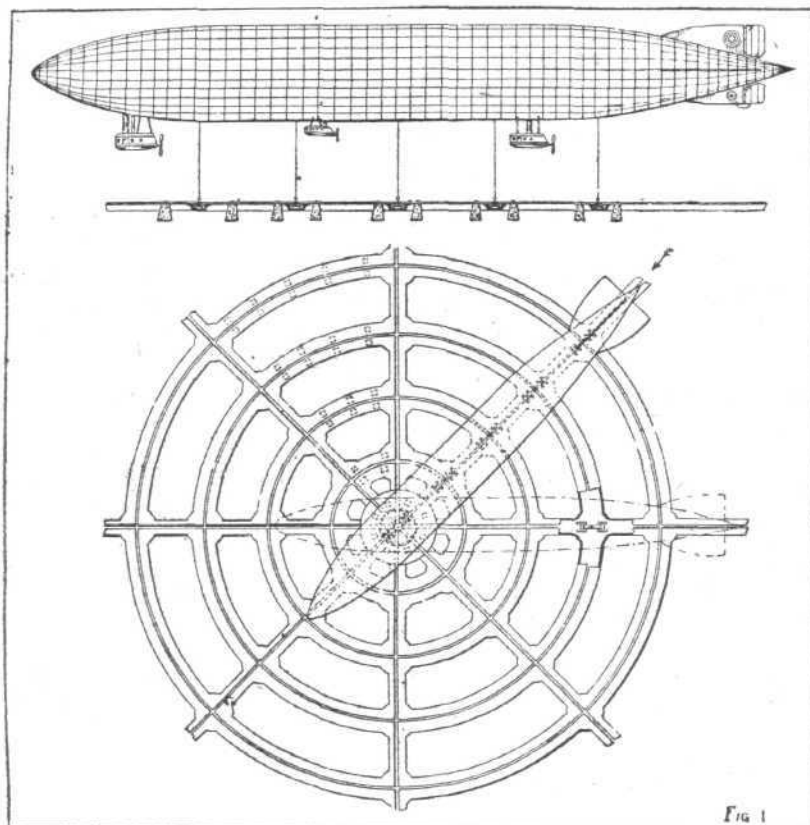
THE MOORING OF AIRSHIPS

THAT the problem of airship harbours is one of considerable importance was emphasised rather forcibly by the recent disaster to our rigid airship "R. 34." There can be no denying the fact that any effort to further the development of airship design and construction, and airship services, will be as good as valueless if equal attention be not also given to such questions as mooring, housing and harbours. The accompanying description and illustrations of an arrangement for mooring airships should, therefore, be of special interest.

The mooring arrangement in question is the invention of E. S. Ullmann, of Manhattan, U.S.A. Briefly, it consists of a circular "platform" having a series of slot-rails disposed radially and concentrically, within which travel a number of trolleys. From each of the latter an arm projects through the slot, and to these arms are attached the mooring ropes from the airship, these being disposed at intervals from bow to stern. The radial slot-rails extend beyond the "platform"

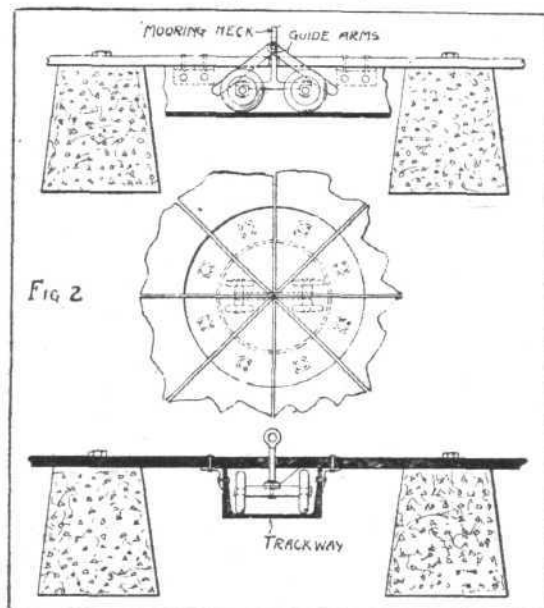
down on to concrete blocks securely embedded in the ground. (Fig. 2.) Below the slots is formed a continuous trackway for the mooring trolleys. At the junctions of the concentric and radial slots these trackways are enlarged so as to permit free turning of the trolley when the latter is guided from one slot to the other.

The trolleys are provided with four wheels with ball bearings, and the mooring neck or post projecting above the slot has a protective collar to take any wear caused by rubbing against the sides of the slot. This neck is connected to the trolley by an axle pin, and can more or less adapt itself to the upward pull of the airship without interfering with the free movement of the trolley. Two arms pivoted to the mooring neck, above the slot, with their ends resting one on the forward and one on the rear end of the trolley carriage, guide the trolleys along the slots. When it is required to turn a trolley from a radial slot to a concentric



The Ullman Mooring Platform for Airships: Fig. 1. Side elevation and plan, showing the airship moored to the trolleys within the slot-rails. In the plan view the ship is shown travelling across the platform along one of the radial slot-rails.

Fig. 2 (below). Detail views of the mooring trolley, slot-rail, etc.



and lead out to various points on the landing ground or to the hangars. On landing, the airship is anchored by its mooring ropes to the arms of the trolleys, which are suitably disposed along one of the radiating slot-rails. The airship, now held down by the trolleys, is then towed along the slot-rails to the "platform," where the trolleys are guided into respective concentric slot-rails. The airship, it should be pointed out, is lying head to wind. (See Fig. 1.) The purpose of this arrangement is such that, as the direction of the wind changes, the airship can swing round with it, the trolleys travelling round, also, within the concentric slot-rails.

It is obvious that there is a variety of ways in which this arrangement may be carried out constructionally, but the following particulars refer to that described in the patent specification. The slot-rails are not unlike those employed for the conduits of electric tramways, special attention being paid to giving increased strength to withstand the upward pull of the airship. The rails are built up in sections bolted

one, or *vice versa*, these guide arms are raised above the slot and using them as levers the trolley is turned to the required position and the arms again dropped into the slot.

In order to check side sway, it is proposed to carry mooring ropes out from the bows to trolleys located in suitable slots on the port and starboard sides of the airship. These trolleys are connected by a tie rod, which keeps them the correct distance apart as they travel along the slots, as with the other trolleys, in response to the swinging of the airship. It is suggested to have two sets of these lateral trolleys, one at the bows and one at the stern.

At the centre of the "platform," where the radial slots intersect, provision is made for a telescopic mooring mast, which when closed disappears below the slot-rail, leaving a clear passage for the trolleys. Gang-planks, it is suggested may be raised to the gondolas, the upper ends being readily hooked into staples on the gondola sides, whilst the lower ends would be carried on rubber-tyred caster wheels.

The Pescara Helicopter "Flies"

FROM Barcelona it is reported that the Pescara helicopter has been tested in the garden of its inventor. Although weighing a matter of 880 kilograms (1,760 lbs.), and having an engine of 120 h.p. only, the machine is said to have risen easily, and to have remained at a height of one foot for a considerable time. One presumes that the height attained does not represent the ceiling of the machine, but that she was kept there by anchoring arrangements of some sort. Later M. Pescara intends to have the machine transferred to the Barcelona aerodrome for the official tests.

Commercial Aviation in Queensland

By means of aviation the railheads of Central Queensland are being linked up with the far western centres of the State, most of the work being done by the Queensland and Northern Territory Aerial Service, Ltd. This Company has just introduced the first Avro commercial triplane ever seen in the Commonwealth. The machine is provided with a comfortably-fitted enclosed cabin, with accommodation for four passengers, who are protected from the weather and most of the noise. The power is supplied by a 160 h.p. Beardmore engine, and a speed of 90 miles an hour is attained.

CROYDON TERMINAL AERODROME

Monday Evening, May 30

As a natural outcome of the rapid growth of air travel, last week's traffic between London and the Continent broke all existing records. If the passenger bookings continue to increase at the same rate, some of the fondest hopes of the air transport firms will be realised. Last week, for instance, over 370 passengers were carried, whilst the aeroplanes employed flew a distance of over 21,000 miles.

It is hoped to have two British services daily to Paris in the near future, and, as many would-be passengers have of late been disappointed, there appears every reason to believe that full loads will be forthcoming for the extra machines.

The first of the Handley-Page 0-400's arrived at the aerodrome from Paris on Friday, and the two machines which left Cricklewood for Le Bourget on Saturday landed at Croydon from Paris this afternoon. The stores and offices of Handley Page Transport have been transferred here from Cricklewood.

The Instone Air Line have been busy with special flights. Their four-seater B.A.T. has been in constant use, not only on special flights to the Continent, but also on inland flights. On Sunday this machine, piloted by Mr. Powell, left for Paris in order to bring a well-known sportsman to England for the Derby. The "Vimy" and the D.H. 18 have also been fully occupied in the regular service, which on some occasions has had to be duplicated.

On Thursday next the Instone Air Line will run their first "excursion" to Paris. Leaving Croydon at 9 a.m. the air excursionists will reach Paris in time to spend three or four hours in that city before the hour scheduled for the return journey.

The new D.H. 18 G-EAWO has been flown back to Stag Lane for slight alterations.

The Anglo-American Oil Company have practically completed their bulk storage petrol plant, and the underground tank has been filled with 3,000 gallons of aviation spirit. I understand that the Shell people also contemplate a similar installation here.

The Grands Express have had a very successful week. They have surmounted the trouble with their engines, and have carried 92 passengers during the week. In spite of the busy times, Mr. Boudier still manages to keep his garden in trim, and his carnations promise to be the envy of the aerodrome's amateur gardeners.

The tarmac before the entrance to the Customs house has been marked out into mysterious squares. Mr. Shaw, of Basil S. Foster, Ltd., tells me that this arrangement is for speeding-up the departure of the passenger-cars to town. The cars will draw up, one in each numbered square, and passengers will be allotted to a certain car, and their baggage will then go straight to the car from the Customs. This will save the confusion which usually arises when a whole pile of luggage, and a mass of passengers, have to be sorted out.

A large gang of men are busily digging holes in the old aerodrome, where the airship mooring-mast is to be, whilst another gang are just as busy filling them up with concrete. The foundation-work for the mast is now far enough advanced for the erection of the mast itself to begin, and, had it not been

for the inclement weather, a start would have been made today.

Capt. Greig, of Messageries Aérienne, tells me that in addition to two-seater Spads, and the Breguets, his company have now seven of the new five-seater Spads in commission. The 10 a.m. and 4 p.m. services of this Company are quite popular, and they certainly score by being able to offer passengers a chance to get to Paris before lunch, or to stay in London until the afternoon and still be in Paris the same evening.

The new weather-hut is still unoccupied. It has been erected for months, and only awaits paint, light, and telephone. Occasionally a forlorn painter is to be seen applying paint to the window-frames, and then nothing more happens for days or weeks. Mr. Hay, the meteorologists-in-charge, has become quite resigned, and appears to have abandoned all hope of ever occupying the new hut.

The annual grass-cutting is now in progress on the 'drome. It is amusing to see an up-to-date place like an aerodrome still employing an old horse-drawn mower for this purpose. Why the Air Ministry do not buy a motor-mower and keep the grass short all the time, instead of waiting until it is so long that it actually impedes the aeroplanes, is a mystery. From what I hear of the cost of the grass cutting, the price of the motor-mower would be saved in a couple of years; and, anyway, the price would be ridiculously small compared with other expenditure on the aerodrome.

The K.L.M. are still making progress, and I hear good reports of activities in Holland. Work on the aerodromes at Amsterdam and Rotterdam is being pushed forward. At both places an hotel is being erected, in addition to offices and sheds. At Amsterdam the K.L.M. have been permitted to erect a wooden booking office in the centre of one of the principal squares. It is difficult to imagine permission being granted to a British air traffic company to put a booking office in the middle of Trafalgar Square.

On the Amsterdam and Rotterdam aerodromes there is quite a good innovation for indicating the destination of the various machines. A wooden arm is fastened to a stake, and can be stuck in the ground so as to point towards one of the aeroplanes, and the destination of the plane is painted on the arm. With several machines departing within a few minutes of each other, this appears a very sound idea.

Several passengers have booked through from London to Hamburg during the week. Mr. Hopkins, who was ground engineer for Aircraft Transport and Travel, has now joined the Croydon staff of K.L.M.

Joy-riding was very slack during the week-end, the gusty, showery weather keeping people away. Capt. Muir, of the Surrey Flying Services, who now have a monopoly of the joy-riding, is starting a school of flying. He intends to charge his pupils by the hour, and will use either 80 Le Rhone "Avros" or 130 Clerget "Avros."

The cosmopolitan nature of the air-port was well illustrated the other evening, when a party of six sat down to dinner. The party consisted of a Dutchman, a Frenchman, a Belgian, a Russian, and two Britons. Their attempts to exchange aeronautical ideas were really rather funny.

Over the Andes with a Passenger

FOR the first time the Andes have, it is reported, been flown by a pilot carrying a passenger. This is to the credit of two Chilean officers in a De Havilland, who started from Santiago in Chile, with the intention of making for Buenos Ayres. Owing to shortage of petrol, however, they had to finish at San Luis (Argentina), a flight of about 300 miles.

A Monster Mother Ship for 'Planes

U.S. SECRETARY DEABY asks for the immediate construction of an aeroplane-carrying mother-ship as recommended by the Naval Committee of the American House of Representatives. A Bill authorising the construction has been drawn up, the carrier to have a capacity of about 80 'planes, and to cost, approximately, 5 millions.

Australia Asking for Air-Tenders

IN connection with the proposed Australian weekly aerial service between Geraldton and Derby, a distance of about 1,200 miles, it is announced that the Federal Government is asking for tenders to run it. £25,000 is the maximum expenditure fixed upon per yearly contract.

French Aeroplane Safety Prizes

THE following awards in the French "Safety in Aeroplanes" competition have been announced: For a stability

indicator, Courtois Suffit, 1,000 francs; for machine with variable camber and area, MM. Gastambide and Levavasseur, 10,000 francs; for a parachute, Jean Ors, 1,000 francs. Yves Le Prieur has received three prizes: for luminous gyro inclinometer, 2,000 francs; for "Navigraph," 2,000 francs; and for a "Safety Sounder," 1,000 francs.

Fatal Leap from Aeroplane

AN unfortunate accident occurred at Grand Island, Neb., U.S.A., on May 15 last, in which Warren P. Kite was killed. Kite was putting up some stunt flying, before some thousands of spectators, on the small "Kite" biplane—illustrated in *FLIGHT* for April 21, last—when a second machine collided with him. The propeller of the other machine came into contact with the tail end of Kite's machine, and cut it off completely, just back of the cockpit. To those who were looking on from below, it looked as if Kite jumped from the machine, presumably deciding this safer than to remain with it in its certain fall, but perhaps overestimating the distance. He was, of course, instantly killed on striking the ground, having fallen some 800 ft. The pilot of the other machine, J. H. Smith, managed to make a safe descent. It is considered that this accident is the result of unnecessary "stunting," of which there is far too much taking place in the "States" just now.

AIRISMS FROM THE FOUR WINDS

THE date fixed for the Paris Aero Salon is November 12 to November 27, inclusive.

THE Pan-American Air Exhibition has been re-christened. It is henceforth to be known as the "International Aero-nautic Exposition and First Commercial Air Convention."

It is to the credit of the Instone Air Line to inaugurate the first day "Air-excursions" to Paris and back. The proposal is to run a one-day return trip every Thursday to the French capital, for a charge of £12 return. One of the company's limousine express aeroplanes will leave the Croydon aerodrome at 9 a.m., and will return from Paris in time for dinner, arriving at the aerodrome about 7.15 p.m.

This, it is stated, will give passengers 3 or 4 hours in Paris.

WITH commendable foresight the plans of the new Government Post Office building at Chicago, the erection of which has just begun, provide for a flat roof upon and from which mail-planes will be able to alight and take-off. Sooner or later this little village will have to make a like provision, although for the time being it is possible. Amphibians and the Thames together may be able to fill the want.

THE H.P. Air Transport Organisation has now transferred its operating headquarters from Cricklewood to Croydon Air Terminus.

THE problem put forward last week to the Speaker of the House of Commons by Mr. Pemberton Billing as to the steps necessary to relieve him of his Parliamentary duties, has apparently been solved with the consequent announcement in the *Gazette* to the following effect:—"Treasury Chambers, May 27, 1921.—The Chancellor of the Exchequer has appointed N. Pemberton Billing, Esq., to be Steward and Bailiff of the Manor of Northstead."

Wonder what has happened to the "Chiltern Hundreds" of familiar sound?

IN addition to Sir Hildred Carlile, who will be the Unionist Candidate for the vacant seat for East Herts thus brought about, Rear-Admiral Murray F. Sueter is to try his luck as an Independent Candidate for the constituency.

FRANCE's little war bill against Germany for damage in the Paris region amounts to £4,600,000. In this is included compensation for 17,000 claims for damage caused by bombs from aeroplanes and Zepps., and by "Big Bertha" shells. Wonder what the English claim is for the same form of "offensive."

SPECIAL postage stamps for use on mails carried by aircraft are increasing in numbers steadily—in foreign countries. Even South America is not behind in this matter, although we are not quite certain as to the existence of any regular air services in this part of the world. However, they have

got the stamps. Uruguay is the latest S.A. country to produce air mail stamps, a special issue of 25 centesimi stamps overprinted "Correo Aereo," with a figure of an aeroplane above, in blue, being reported recently.

CAUSE and effect. It being evident that there will always be a few American "hustlers" coming and others who will be late for the boat across yonder, the Société Aérienne Française has installed an aviation camp at Querdreville, about three miles from Cherbourg, and it is proposed that a Goliath machine capable of transporting 28 passengers will meet all incoming steamers, and be ready for outgoers if necessary.

EVERYONE knows those label bespattered travel-worn trunks which are—whatever the regular long-distance traveller may think—the pride of the peripatetic globe-trotter and the envy of the less fortunately-placed would-be casual rover. Of late years it has become more and more a sign of the times—present times. And now these folk can still further glorify their baggage in an even more aggressive form by indulging in over-seas air flips, thereby securing a papering of Lep Aerial "By Air" labels, which assert themselves most assertingly with their bright yellow background and the overprinting in flaming red of the words "BY AIR."

A COUPLE of examples of these—which we reproduce—are sent us by Lep Aerial. Every day, at stated hours, the company write us, a number of cars leave the Lep Aerial Office in Piccadilly Circus loaded with passengers and their luggage, with these conspicuous yellow and red labels very much a feature of the landscape.

So popular are these lasting signs of the Continental flight that many passengers ask for a duplicate set; one American gentleman who flew to Paris in the early days wrote some months after for a fresh supply of "stickers," as the original ones had worn off.

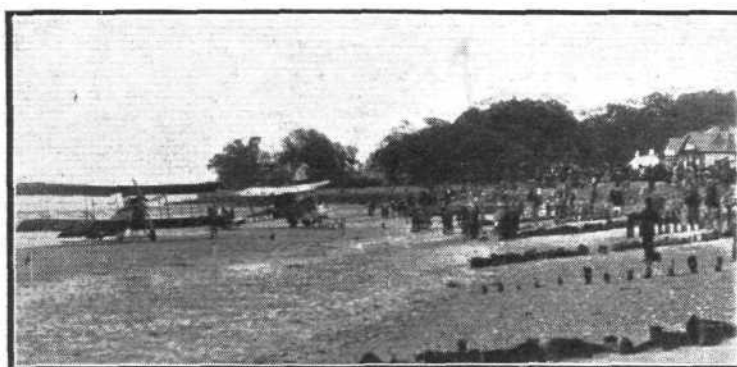
Suit-cases owned by travellers from all parts of the world bear these labels showing—among other destinations—Paris, Brussels, Amsterdam, Bucharest, Zurich, Prague and Cologne.

Well, there's many a worse hobby than this, and in the meantime it is another little inducement to many to assist the Air Services to carry on successfully until such time as the Air Travel labels will lose their pride of place, by reason of the universal use of the air for all matters where speed counts.

NOR only from actual developments during the closing stages in the late War, but from the further "progress" which has since been achieved in elaborating and perfecting various refined "frightfulnesses" against the opening of the next great world's conflict, a fascinating study seems to be growing up with the object of painting the hideous scientific possibilities in store for those who, in the coming decades, dare again to raise the God of War on high. Obviously operations aviatric and wireless, individually and

PER K L M SERVICE	By Air. to Everywhere.	DATE 25 MAY 1921 TIME 10.30
		
To BY AIR		
LEPAERIAL TRAVEL BUREAU (CRITERION CORNER), Piccadilly Circus, London, W.1. THE HEADQUARTERS OF THE AIR TRAVELLER.		

PER INSTONE AIR SERVICE	By Air. to Everywhere.	DATE 25 MAY 1921 TIME 12.30
		
To BY AIR		
LEPAERIAL TRAVEL BUREAU (CRITERION CORNER), Piccadilly Circus, London, W.1. THE HEADQUARTERS OF THE AIR TRAVELLER.		



FLYING IN "THE ISLAND" : On Thursday of last week the Brompton Motor Company inaugurated joy-riding in the Isle of Wight, where they will continue during the summer. The photograph on the left shows two of the machines on the sands between Ryde and Seaview, and on the right are seen, standing by the D.H. 6, Lieut.-Col. A. T. C. Veasey, and Capt. R. E. Dean, the latter one of the pilots of the firm.

in combination through the realm of the air, occupy no inconsiderable place in these foretellings. One of the latest to indulge is Mr. Denis Gwynn, writing in the *Review of Reviews*. Premising that during the War the practicability of manœuvring pilotless aeroplanes by wireless had been completely demonstrated, Mr. Gwynn proceeds to speak of the immense potentialities which the further experiments since the Armistice have brought within the range of practical application. He writes that :—

"The French electrical engineers have actually demonstrated already that the military and naval strategy of all countries will within a few years have to reckon with the existence of air fleets not only immeasurably swifter, more powerful, and more efficient than any machines used in the last war, but capable of flying under the direction of wireless control exercised at great distances from the scene of their operation. Moreover, this terrifying progress in wireless invention has made possible the creation of shoals of submarines and torpedoes which can be similarly navigated and manipulated; working as automatic machines, far from their base, they are capable of maintaining a prolonged and undeviating course and of changing direction at will in the pursuit of the ships they are sent out to destroy.

"Whole fleets of wireless aeroplanes capable of carrying great cargoes of high explosive or gas shells could be sent out hour after hour to attack towns or enemy forces. It is calculated, for instance, that a fleet of only 300 machines, each carrying some 5 cwt. of bombs, could, within twenty-four hours, unload nearly 2,000 tons of bombs at any reasonable distance such as separates the chief military centres of several of the principal European Powers, whereas the whole French air force managed to discharge an average of less than 20 tons a day over the German lines, even in the closing months of the War. It requires only a simple adaptation of wireless control to the aeroplanes to enable them either to drop bombs automatically or to take photographs. Furthermore, the possibility of flying at high altitudes once there is no necessity to consider the weakness of human lungs will make great speeds possible and add enormously to the difficulties of defence from bombing attacks."

MR. GWYNN continues: "Such are some of the problems with which these latest wireless discoveries confront the military strategist. Their application to naval warfare is even more destructive to all the traditional organisation of attack and defence, for torpedoes propelled and guided by wireless will make it utterly impossible for a fleet to attack any base where any large quantity of electric torpedoes are to be encountered. It is the Americans who have concentrated most successfully on the application of wireless control to naval war. In one demonstration a motor boat travelling at twenty-three miles an hour was steered through a crowd of merchant ships at Fort Monroe under the control of an

aeroplane flying at 5,000 ft. and from two to five miles away, while the pilot of the aeroplane had no more difficulty in managing the ship than would a good pilot on board her. By using one hand to guide his machine and the other to manage the apparatus controlling the boat, he was able to direct both with ease. A fleet of such boats controlled at long distances from the air would revolutionise the practice of naval war.

"The introduction of torpedoes controlled by wireless is the worst nightmare of all, and its feasibility has long been proved. Guided from the air and propelled by electricity transmitted by wireless, the torpedoes of the future will not only have an immensely longer range, but will be able to change their direction and follow their victims relentlessly until they have tracked them down. These are not fantastic conceptions of experiments which are still being tried. They have already been completely demonstrated, and their first successes date from three years ago."

WITH the coming of summer, aerial enterprise, and especially joy-riding, takes on a new lease of life. On the east coast, down Clacton way, a firm is running week-end joy-rides, taking off a bit back from the sea at Plough Corner, Little Clacton, which rather looks as if the local authorities were not inclined to help them along from the sea front. This rather suggests that Clacton is a bit behind the times. However, the firm appears to have been quite busy (at Easter, Whitsun and on week ends, and the Avro can be seen at all times of the day flipping passengers down to the sea and back again. On the south coast a good beginning has been made in the Isle of Wight, where the Brompton Motor Company, Ltd., have inaugurated joy-rides. A commencement was made last Thursday, when two D.H. 6 machines with 80 h.p. Renaults inaugurated the flying from the sands between Seaview and Ryde. The firm have obtained the use of the sands in various localities, and also have either completed or in course of preparation land aerodromes at Newport, Sandown, Freshwater and Yarmouth. Altogether it looks like being a busy season on "The Island," and the two pilots, Capt. A. H. Dalton and Capt. Dean, will have their hands full.

At Croydon the Surrey Flying Services are extending their normal activities as "Joy-Riders" to running a flying school. This is all to the good, as school work is always an indication of interest in flying, while the efforts of "pups" are sometimes more entertaining than the evolutions of old hands. At any rate this was the case in the old days when Blériots were being used. Modern machines do not, apparently, have the same knack of swerving off their course abruptly while taxiing. May this new move prove but the beginning of big things in the same direction.

Fencing at Olympia Royal Tournament

ON May 25, the *Épée v. Épée* Championship for officers of the R.A.F. was decided. Seven competitors entered, the outstanding best being Flight-Lieut. F. G. Sherriff, M.C., who in six encounters only sustained one defeat. Squadron-Leader Rev. J. R. Walkley was second with two defeats,

and Squadron-Leader H. Ellershaw secured third with three defeats. The results in other R.A.F. ranks were :— 1, Sergt.-Maj. H. Grainger, R.A.F.; 2, Sergt.-Maj. R. E. Gorwood, R.A.F.; 3, A.C.2 E. J. Lampard, R.A.F.

On April 27, Princess Beatrice was present at the Tournament, and presented the prizes to the winners.

THE ROYAL AIR FORCE

London Gazette, May 24

Permanent Commissions

Flying Officer H. G. Sawyer, A.F.C., is granted a permanent commn., retaining his present substantive rank and seny.; May 18, 1920; *Gazette* of that date appointing him to a short service commn. is cancelled. Flight-Lieut. J. H. Norton, M.C., D.F.C., resigns his commn., and is permitted to retain rank of Capt.; Sept. 1, 1920, substituted for *Gazette* Sept. 17, 1920. Flight-Lieut. F. L. C. Butcher is placed on h.p., Scale B, for six months, commencing June 1. Flying Officer G. Archer is placed on h.p., Scale B, from Aug. 1, 1919, to Dec. 12, 1919, inclusive.

Medical Branch

Capt. (Bt. Maj.) F. C. Cowtan, R.A.M.C., is granted a permanent commn. as Squad.-Leader; Sept. 1, 1919.

Stores Branch

Flight-Lieut. D. W. Wilson is granted a permanent commn., retaining his present substantive rank and seny., with effect from Sept. 16, 1919, and is transd. to Stores Branch, with effect from June 17, 1920; *Gazette* Sept. 16, 1919, appointing him to a short service commn. is cancelled. Flying Officer F. N. Trinder is granted a permanent commn., retaining his present substantive rank and seny.; June 17, 1920.

Short Service Commissions

The following are granted short service commns. in ranks stated, with effect from dates indicated:—

Flying Officer, from Flight-Lieut.—J. F. Horsey; April 10.
Flying Officers, with Seny. of Dates Indicated.—G. F. Blackburn; April 23; G. F. E. Harrison, May 9; H. W. Hewson, May 7.

Flying Officer, from Pilot Officer.—D. M. Matthews, May 12, and with seny. of that date. Flying Officer Horsey will be placed at the head of the list of Flying and Observer Officers, but junior to all officers granted short service or permanent commns. in a rank lower than their previous substantive rank.

Seconding

Flying Officer (Hon. Flight Lieut.) E. J. Nightingale (Paymaster-Lieut., R.N.) relinquishes his temp. commn. on return to Naval duty; May 16.

Flying Branch

Sec. Lieut. (Hon. Lieut.) E. M. Harris to be Lieut.; Dec. 1, 1918. R. P. A. Crisp (Lieut., E. Ontario R., C.E.F.) is antedated in his appt. as Sec. Lieut. (Hon. Lieut.) Observer Officer; Aug. 8, 1918. Flight Lieut. A. Rowan to be Flight Lieut. (O.) from (S.O.); Jan. 16, substituted for *Gazette* Feb. 10,

1920. Sec. Lieut. (Hon. Lieut.) A. O. Helps (unemployed list) relinquishes his temp. commn.; July 27, 1920. Sec. Lieut. (Hon. Lieut.) C. E. Oglesby relinquishes his temp. commn. on ceasing to be employed; Jan. 20, 1919. Lieut. E. M. Harris relinquishes his temp. commn. on return to Army duty; Dec. 1, 1919, substituted for *Gazette* Dec. 19, 1919. Sec. Lieut. W. J. Jones is transferred to unemployed list; March 12, 1919. Lieut. E. C. Bredin is removed from unemployed list and is deprived of rank of Lieut. on conviction by the Civil Power; March 8.

Technical Branch

Sec. Lieut. W. E. Hunt to be Lieut.; May 8, 1919, since demobilised (substituted for *Gazette* Feb. 20, 1920). Lieut. H. B. Smith is transferred to unemployed list; May 15.

Medical Branch

The following Flight Lieuts. relinquish their temp. commns. on ceasing to be employed, and are permitted to retain rank of Capt.:—S. G. Seymour, M.B.; May 1. K. F. D. Waters, M.B., B.A.; April 1.

Stores Branch

The temp. commns. of Flying Officers S. A. Alexander and C. G. Riley are terminated on cessation of employment; May 25.

Memoranda

Flying Officer A. C. McKelvie relinquishes his temp. commn. on ceasing to be temporarily re-employed; April 23.

Three Cadets are granted hon. commns. as Sec. Lieuts., with effect from the dates of their demobilisation.

London Gazette, May 27

Short Service Commissions

The following are confirmed in the rank of Pilot Offr., with effect from the dates indicated:—F. V. Gauntlett, E. F. Kohler, C. D. Robertson, M.M., E. A. Rush; April 29. R. E. Baugh; April 30. E. R. Lush; May 9.

Flying Branch

Lieut. E. M. Pocock is transd. to the Unemployed List; Oct. 7, 1919.

Memorandum

Col. (actg. Brig.-Gen.) R. E. T. Hogg, C.M.G., C.I.E. (Maj. (Bt. Lieut.-Col.), Indian Army.) resigns his commn., and is granted the honorary rank of Brig.-Gen.; Sept. 1, 1919. (Substituted for *Gazette*, Sept. 9, 1919.)

Erratum

Gazette of May 3.—For Flying Offr. J. C. O. Dickson read Flight Lieut. J. C. O. Dickson.



IN PARLIAMENT

Helicopter Machines

Lieut.-Commander KENWORTHY, on May 24, asked the Secretary of State for Air if he is in a position to state the result of recent experiments with the helicopter flying machine; whether experiments are being continued; whether he will consider offering a prize or bonus to inventors for successful flights made under, or improvements to, this system; and whether the Air Ministry is using all possible efforts to develop this system in view of its possibilities for commercial flying?

Capt. Guest: In reply to the first and second parts of the hon. and gallant Member's question, I regret to say that the developments of the helicopter experiments are not yet sufficiently advanced to show definite results, but as soon as they are obtained, full information will be given. Anyone who solves this problem will be sufficiently rewarded by the patents which he will retain and the number of orders which he will receive. The Air Ministry are conducting experiments in this direction, and are utilising the brains and money which are at their disposal in the way which seems to them to promise the best and speediest result?

Lieut.-Commander Kenworthy: Is the right hon. gentleman aware that the French have offered substantial prizes to anyone who solves the problem? Would it not be worth while for the Ministry also to offer prizes in view of the benefit that would be derived?

Capt. Guest: The system of bonuses and prizes for inventions was, as the hon. gentleman knows, in operation during the War, but since then we have had to discontinue it.

Mr. Raper asked whether the Air Ministry is financing experiments with a helicopter at or near Farnborough, which are being carried on by Mr. Brennan; if so, whether the Brennan helicopter has been given a trial; whether it has succeeded in rising from the ground; and what sum has been allocated for these experiments?

Capt. Guest: The answer to the first part of the question is in the affirmative. To the second and third parts, in the negative, and to the fourth, that a sufficient sum has been allocated to enable these promising experiments to be continued.

British Air Lines Subsidy

Mr. RAPER asked whether the present subsidy to British air lines is confined to one machine per day in each direction; and, if so, whether this limiting of the services results in the turning away of would-be passengers?

Capt. Guest: The present subsidy is designed to assist the running of two machines in each direction each day, but there is no restriction against the firms operating additional machines without subsidy. The lack of sufficient suitable machines, however, has hitherto limited the service to one machine in each direction each day, except on special occasions, and, as a consequence of this shortage, and of the expansion of the traffic, would-be passengers are being turned away.

Mr. Mills: Has this any relation to the increased cost of the postal service?

Capt. Guest: No, Sir, we have no contract with the Post Office at the moment.

—Capt. Terrell: Is the right hon. gentleman aware that the passengers turned away by British companies are being carried by the French companies?

Capt. Guest: Yes, Sir.

Air-worthiness Certificates

Mr. RAPER asked whether foreign aeroplanes plying for hire or reward in this country are required to have an air-worthiness certificate which guarantees them to be up to the standard of British machines holding these certificates?

Capt. Guest: Under the International Air Convention, every aircraft engaged in international navigation must be provided with a certificate of air-worthiness issued or rendered valid by the State whose nationality the aircraft possesses. Until the standard minimum requirements of such certificates shall have been laid down by the International Commission for Air Navigation, the individual States are responsible for determining the conditions under which their certificates may be granted.

Mr. Raper: Do the certificates held by the French machines show that they are of equal efficiency with the British machines?

Capt. Guest: My hon. friend will appreciate from the reply I have given that the matter of the International Air Convention has not yet been definitely ratified in the fullest international sense. Our hope is that the negotiations will terminate in that sense.

Air Station, River Thames

Mr. GILBERT, on May 25, asked the Secretary of State for Air whether it is proposed to have an air station for aeroplanes upon the River Thames; if so, can he state what part of the river will be utilised for that purpose; if it is proposed to erect a proper pier or landing-place for passengers arriving or departing from the river; will the aeroplanes who use the station be under the control of his Department, or will the station be allowed to be used by commercial aeroplane companies; if the Government services will be utilised for Post Office mails; and what steps have been taken in order that the ordinary navigation of the river shall not be stopped or interfered with?

Capt. Guest: The answer to the first part of the question is, that the flights to and from the Thames which have recently taken place have been of a purely experimental nature, in order to determine whether the river could be used by aircraft. The answer to the second part is, that the stretch between Westminster and Albert Bridges is considered the most suitable portion. The answer to the third part is, that the erection of a special pier would be undesirable, and it appears probable that it will also be unnecessary. The answer to the fourth part is, that if it is eventually decided that aircraft may alight on and depart from this portion of the Thames, it is anticipated that the arrangements would, so far as possible, conform to those at Government-owned civil aerodromes. The answer to the fifth part is, that it is intended to adhere to the existing principle that the mails are carried by commercial services. The answer to the sixth part is, that the whole investigation of this question has been carried out in close co-operation with the Commissioner of Police and the Port of London Authority, in order that the safety of the public and the interests of other users of the river may be adequately safeguarded.



'Planes Assist Smuggling in Canada.

H. H. STEVENS, of Vancouver, B.C., told the Canadian House of Commons that smugglers, or their confederates, on

incoming ships drop drugs, etc., into the water, which are spotted by an aeroplane, and later salvaged. It is thought that this practice is extensive.

Models

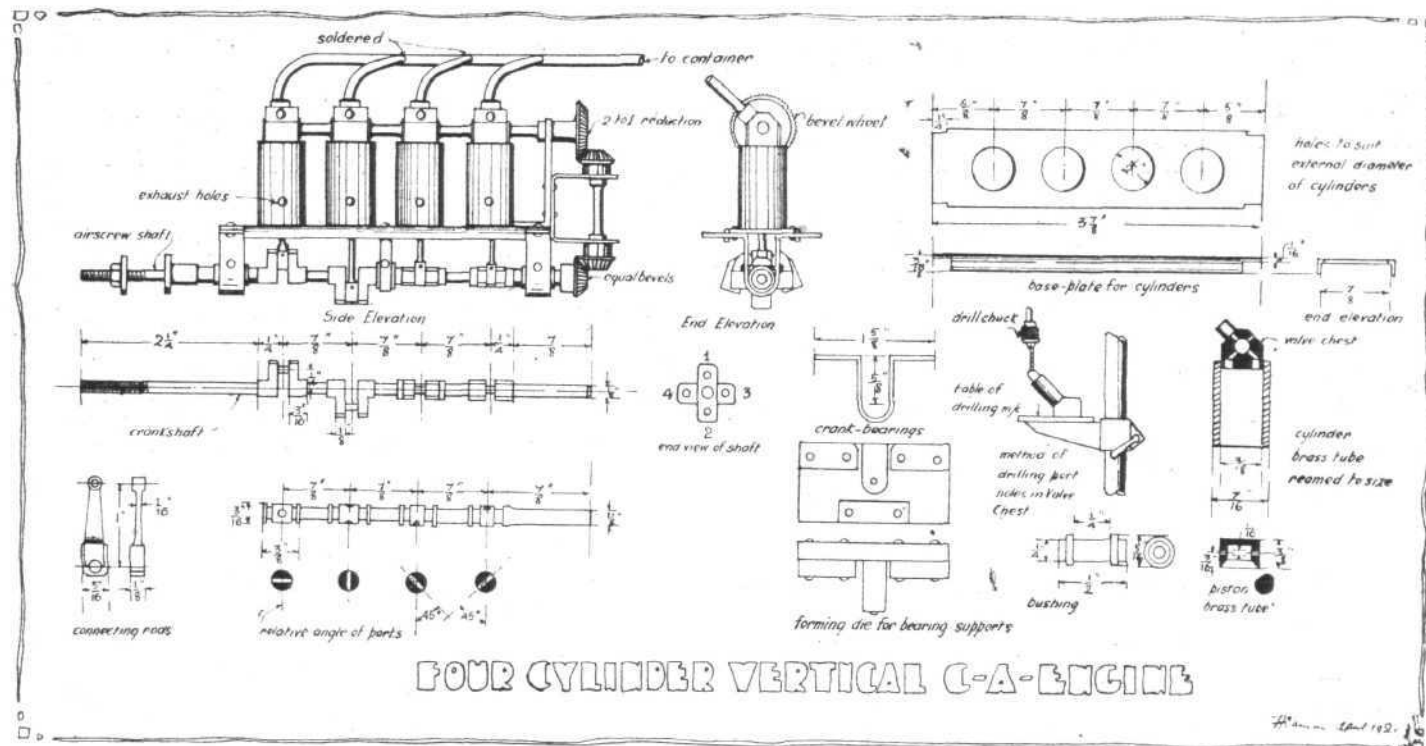
NOTE.—All communications should be addressed to the Model Editor. A stamp should be enclosed for a postal reply.

A Four-Cylindered Vertical Compressed Air Motor

A FOUR-CYLINDERED light-weight compressed air engine is shown by the accompanying drawings. Its total weight is 4½ ozs., and it is capable of driving a model weighing 2 lbs. It is $\frac{3}{4}$ in. bore by $\frac{1}{2}$ in. stroke, with overhead rotary valves, which are simple in construction, as there are no flat surfaces to be finished as with the ordinary slide-valve.

A small ball-thrust bearing can be mounted at the front end of the crankshaft if desired.

Mr. R. F. MASON writes: "With reference to your query recently in FLIGHT as to why twin screws have not been more usually employed in the construction of tractor models, I should like to say that a series of experiments



FOUR CYLINDER VERTICAL C-A-ENGINE

The cylinders are made from $\frac{3}{8}$ -in. brass tubing reamed to $\frac{3}{8}$ -in. bore. Drill the exhaust holes before reaming, as the latter operation will then remove the burrs caused by drilling.

When drilling the inlet and exhaust ports in the top of the cylinder, care must be taken to drill them accurately to the angle indicated. The best way to do this is to mount a $\frac{3}{8}$ -in. pin in a block at an angle of 45° (as shown in Fig. 6), and hold the cylinders on this when drilling the ports. The lower end of the cylinder is threaded with a micrometer thread (40 threads per inch) to take the ring shown by Fig. 1.

The connecting rods are made from $\frac{1}{8}$ -in. steel or brass. The lower half of the big end is riveted on carefully after the rod has been put in place on the crankshaft.

The plate to which the cylinders are fastened is made of $\frac{1}{8}$ -in. steel bent over at the edges to increase the stiffness. The cylinders are held on by means of the ring, Fig. 1. Another method of fastening them is shown in Fig. 5; they are clamped down with small steel strips and screws.

The crankshaft is of the built up type. The shaft is $\frac{1}{2}$ in. drill rod; the crank webs are made from $\frac{3}{16}$ -in. steel, pinned on with $\frac{1}{32}$ -in. steel pins. The bushings are brass, the design for the two end ones being shown in Fig. 2. The centre bushing is $\frac{3}{8}$ in. in length, and is split to permit its being placed on the shaft.

The bearing supports (Fig. 3) are made of $\frac{1}{2}$ -in. \times $\frac{1}{16}$ -in. flat steel, bent on the forming die shown in Fig. 4. The centre support is made only $\frac{3}{8}$ -in. across the top instead of $1\frac{1}{8}$ in., and must also be bent out to clear the cylinder clamping rings. The bushings are clamped in place with screws, as shown. The same size screws are also used to fasten the supports to the plate.

The valve shaft is turned from $\frac{1}{4}$ -in. steel rod, and it should fit the holes in the cylinders as tightly as possible without undue friction. The packing grooves are wound with oil-soaked thread or soft string before it is put in place. It is driven by bevel gears at one-half crankshaft speed. The large gear is $\frac{3}{4}$ -in. diameter, the smaller ones $\frac{1}{8}$ -in. The bracket supporting the gear shaft is made from $\frac{1}{4}$ -in. \times $\frac{1}{16}$ -in. steel. The air feed pipes are brass tubing, $\frac{1}{4}$ -in. outside diameter.

carried out by me some eight years ago with models of this type, showed that the difficulty of providing sufficient fin area behind the c.g. to balance the fin effect of the two tractors is so great that models of this type almost invariably suffer from the defect of bad directional stability. It does not seem to be sufficiently appreciated that airscrews—both model and full-size—when running at full power, exert a fin effect very much greater than that due to their projected side area. In proof of this I should like to cite the case of the twin-pusher 'Fighter' produced by me six years ago, in which the fin effect of the two large geared-down airscrews, situated some 2 or 3 ft. behind the c.g., was so great that every pilot who flew this machine found that she responded much quicker to the rudder when the engine was throttled down than when running 'all out.'

"A further point. Need torque be more apparent in the case of tractors than with pushers? Should it not be just the opposite? The slipstream from an airscrew follows a helical path, and should tend to neutralise torque owing to the downward trending slipstream on one side reducing, in effect, the incidence, and consequently lift, of that wing which is tending to rise as a result of the torque. In the same way, the slipstream increases the incidence of the wing on the other side which is being depressed by the torque. Whether it is possible to so design the airscrew, main aerofoils, and tail, that the slipstream will exactly neutralise the torque, I do not know. Possibly some of your readers may have carried out experiments in this direction. If so, their experience and results would make interesting reading."

"Aluminium Leaf" for Propellers

It is stated that a process of applying aluminium leaf, in much the same manner as gold leaf is applied to picture frames, window signs, etc., by means of which excellent results are obtained from model propellers so treated in so far as they are practically moisture proof.

The propeller has to be properly prepared before the application of the aluminium leaf, which must be put on with great care, after which a good enamel and varnish finish is added. We believe tests have been made with this process on ply-woods, etc., for full-sized machines.

PERSONALS

Obituary

Lieut.-Col. OSWALD WATT was accidentally drowned, whilst surf-bathing, in Sydney Harbour on May 21 last. He obtained his pilot's certificate in 1911 on Salisbury Plain, and later did much flying in Egypt on a Blériot. He joined the French Air Service when War broke out, and later transferred to the Australian Flying Corps, in which he commanded a scouting squadron. With this squadron he distinguished himself in attacking the enemy with machine guns at Cambrai in 1917. In recognition of his services with the French he was awarded the Legion of Honour and the Croix de Guerre.

To be Married

The engagement is announced between Capt. CHARLES PHILIP OLDFIELD BARTLETT, D.S.C. and Bar, R.A.F., son of the Rev. C. O. and Mrs. Bartlett, of Minsterworth Vicarage, Glos., and JOAN AIKIN-SNEATH, daughter of Mr. F. Aikin-Sneath, J.P., and Mrs. Aikin-Sneath, of Tibberton Court, Glos.

The engagement is announced between Capt. PHILIP BATEMAN, London Irish Rifles and R.A.F., son of the late Alfred George Bateman and Mrs. Bateman, of 7, Queen Anne Street and Feltham Court, Middlesex, and MARIE LOUISE BLANC, eldest daughter of Mme. IRÈNE PROCOPIU, Lady-in-Waiting to H.M. the Queen of Rumania.

Death of Professor Schoukovsky

It is reported that the well-known Professor Schoukovsky has died at Moscow at the age of 74. His name will be most familiar to British readers from the deep-section, high-lift aerofoil which bears his name. This aerofoil gave some extraordinary results in the way of high lift, results which appeared quite fantastic until it was pointed out that they were obtained by fitting vertical baffle plates at the end of the wing so as to stop, or at any rate greatly reduce, end losses.

Professor Schoukovsky first of all made hydrodynamics his speciality, and from this it was not a far step to aerodynamics. In the latter branch of science he attacked and simplified the problem of the surface of infinite size, and he visualised a circular movement of the air around the aerofoil, which formed the basis upon which Prandtl, of the Gottingen laboratory, later built up his theory. In this country a similar theory was formulated by Lanchester.

It is said that the Bolsheviks realised the eminent position held by Professor Schoukovsky, and allowed him to arrange special courses in aerodynamics. They are even stated to have gone so far as to allow him to draw increased food rations, which should probably be looked upon as a very great compliment to the famous scientist.

Fatal Accident at Hamble

A SAD occurrence has to be recorded in the fatal accident on the afternoon of April 25, at Hamble, Hants. The machine was privately owned by Mr. P. J. Pinckney, an Argentine ranch-owner, and was being piloted by Mr. T. L. Tebbitt, late R.A.F., from Lymington to Hamble, with Mr. Pinckney and his niece, Miss Frances Pinckney, they having in the morning flown from Croydon to Lymington. Apparently when landing the machine crashed, although at the subsequent inquest little light was thrown upon the cause of the mishap. The owner was killed instantly, and Pilot Tebbitt survived only a short time. Miss Pinckney, who sustained severe injuries to the legs and arms, is in hospital, and not likely to be able for some months to help to elucidate the cause of the accident.

American Ambulance 'Plane Comes to Grief

FROM New York it is reported that a machine which had been converted into an ambulance, carrying pilot and six passengers, came to grief in West Virginia during a violent thunderstorm. The machine was returning from the air station at Langley Field, Hampton, Virginia, to Washington, when it encountered the storm which caused it to crash. Other machines which were in the air at the same time had the greatest difficulty in weathering the storm, and the famous pilot Rickenbacker, who was on his last stage of a flight across the Continent, had to make a forced landing on the side of a mountain. It is stated that the opinion has been expressed that the wrecked machine was probably somewhat heavily loaded, and that, in consequence, she was rendered less controllable, which fact, coupled with the extremely violent gusts, may have helped to bring about the accident which cost the lives of seven people, among whom was Col. Archie Miller, who commanded the United States Air Forces in France.

The U.S. Navy Service "Messenger" Biplane

THE Lawrence Sperry Aircraft Co., Inc., of Long Island, N.Y., write us as follows:—"It has been brought to our attention that through some mistake the impression has gone out that we were responsible for the design of the little Messenger machine, which has been described in articles in your paper as the Sperry Messenger. We wish to correct this impression by advising you that this machine was designed by the Engineering Division of the U.S. Air Service at McCook Field, Dayton, Ohio, and that the credit of the general design of this remarkable little machine is due to the McCook Field Organisation.

We presume that in view of the fact that our plant was the one chosen to turn some of these machines out that the name Sperry was added to the description of this machine in the absence of the facts."

In our description of this machine on February 17 last, FLIGHT made the position quite clear, as referred to above.]

PUBLICATIONS RECEIVED

Les Moteurs d'Aviation "Bristol." The Bristol Aeroplane Co., Ltd., Filton House, Bristol.

Technical Note No. 50. The Gordon Bennett Airplane Cup, 1920. By W. Margoulis. National Advisory Committee for Aeronautics, Navy Building, Washington, D.C., U.S.A.

Report No. 93. Aerodynamic Characteristics of Aerofoils National Advisory Committee for Aeronautics, Navy Building, Washington, D.C., U.S.A.

Report No. 100. Accelerometer Design. National Advisory Committee for Aeronautics, Navy Building, Washington, D.C., U.S.A.

Report No. 103. Performance of a 300 Horse-Power Hispano-Suiza Airplane Engine. National Advisory Committee for Aeronautics, Navy Building, Washington, D.C., U.S.A.

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